

Docket No. 500.43031X00
Serial No. 10/642,632
Office Action dated April 7, 2006

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (Currently amended) A fuel cell for generating an electric energy with a chemical reaction between hydrogen and oxygen, comprising,

a membrane electrode assembly for generating an electric field through the membrane electrode assembly with the chemical reaction between the oxygen and the hydrogen,

a pair of first and second contact members, the first contact member contacting a first side surface of the membrane electrode assembly, and the second contact member contacting a second side surface of the membrane electrode assembly, and

a pressing member for generating a pressing force for urging each of the first and second contact members toward corresponding one of the first and second side surfaces in a pressing direction

wherein the first and second contact members contact each other through a mutual contact area other than the first and second side surfaces while the first and second contact members are mechanically connected to each other through the first and second side surfaces, and in a cross sectional view of the fuel cell taken along an imaginary plane which imaginary plane passes the pressing member and the first and second side surfaces and extends parallel to the pressing direction, the pressing member is arranged between the mutual contact area and each of the first and

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second side surfaces in a transverse direction perpendicular to the pressing direction.

2. (Original) A fuel cell according to claim 1, wherein the fuel cell is a direct methanol fuel cell, a liquid fluid including the hydrogen is capable of being supplied to the membrane electrode assembly through one of the first and second contact members, and the oxygen is capable of being supplied to the membrane electrode assembly through another one of the first and second contact members.

3. (Canceled)

4. (Currently amended) A fuel cell according to claim-3_1, wherein in the cross sectional view, the mutual contact area is prevented from being arranged at a position between the pressing member and the each of the first and second side surfaces in the transverse direction so that the pressing force is prevented from passing the position to bypass the first and second side surfaces.

5. (Original) A fuel cell according to claim 1, wherein the pressing member is a screw for pressing the each of the first and second contact members against the corresponding one of the first and second side surfaces in accordance with a rotational movement of the screw.

6. (Currently amended) A fuel cell according to claim-3_1, further comprising an elastic member through which the first and second contact members are mechanically connected to each other, wherein the elastic member is arranged

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at a position between the pressing member and the each of the first and second side surfaces in the transverse direction as seen in a direction perpendicular to the pressing direction and the transverse direction, and a rigidity of the elastic member in the pressing direction against the pressing force is significantly smaller than a rigidity of the membrane electrode assembly in the pressing direction against the pressing force so that the pressing force is substantially prevented from passing the position to bypass the first and second side surfaces.

7. (Original) A fuel cell according to claim 6, wherein a part less than 10% of the pressing force passes the elastic member to bypass the first and second side surfaces.

8. (Original) A fuel cell according to claim 1, wherein the first and second contact members are electrically isolated from each other, and includes respective first and second electrodes to be electrically connected to the first and second side surfaces respectively in such a manner that an electric circuit is formed through the first and second electrodes and the first and second side surfaces.

9. (Original) A fuel cell according to claim 1, wherein the hydrogen is capable of being supplied to the membrane electrode assembly through one of the first and second contact members, and the oxygen is capable of being supplied to the membrane electrode assembly through another one of the first and second contact members.

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10. (Original) A fuel cell according to claim 1, wherein the membrane electrode assembly includes an anode for ionizing the hydrogen therein, a cathode for reducing the oxygen therein, and an electrolyte layer between the anode and cathode, and one of the first and second side surfaces is formed on one of the anode and cathode, and another one of the first and second side surfaces is formed on another one of the anode and cathode.

11. (Original) A fuel cell according to claim 1, wherein at least one of the first and second contact members has a recess for receiving therein the membrane electrode assembly.

12. (Currently amended) A fuel cell according to claim-3_1, wherein the mutual contact area is formed on a protrusion of at least one of the first and second contact members.

13. (Currently amended) A fuel cell according to claim-3_1, wherein at least one of the first and second contact members includes a thin band arranged between the first and second contact members to form the mutual contact area on the thin band.

14. (Currently amended) A fuel cell according to claim-1, for generating an electric energy with a chemical reaction between hydrogen and oxygen, comprising:
a membrane electrode assembly for generating an electric field through the
membrane electrode assembly with the chemical reaction between the oxygen and
the hydrogen;

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a pair of first and second contact members, the first contact member contacting a first side surface of the membrane electrode assembly, and the second contact member contacting a second side surface of the membrane electrode assembly; and

a pressing member for generating a pressing force for urging each of the first and second contact members toward corresponding one of the first and second side surfaces in a pressing direction;

wherein the pressing member has a head surface area extending in the transverse direction and contacting one of the first and second contact members to urge the one of the first and second contact member toward the corresponding one of the first and second side surfaces in the pressing direction, and the first and second contact member are prevented from contacting each other within the head surface area as seen in the pressing direction.

15. (Original) A fuel cell according to claim 1, wherein at least one of the first and second contact members is bent by the pressing force in such a manner that at a contact point between the membrane electrode assembly and at least one of the first and second contact members, a tensile stress is generated on a front surface of the at least one of the first and second contact members facing to the membrane electrode assembly and a compressive stress is generated on a reverse surface of the at least one of the first and second contact members opposite in the pressing direction to the front surface.

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16. (Original) A fuel cell according to claim 1, wherein one of the first and second contact members has a convexly curved surface contacting corresponding one of the first and second side surfaces of the membrane electrode assembly.

17. (Original) A fuel cell comprising,
an anode side member including an anode collector portion,
a cathode side member including a cathode collector portion, and
a membrane electrode assembly including an anode for oxidizing a fuel, a cathode for deoxidizing an oxygen and an electrolyte between the anode and cathode, and clamped between the anode side member and cathode side member,
wherein the anode side member and cathode side member are connected to each other through supporting portions at an radially outer side of an outer periphery of the membrane electrode assembly, and are urged toward each other between the membrane electrode assembly and each of the supporting portions.

18. (Original) A fuel cell comprising,
an electrode for one of oxidizing a fuel and deoxidizing an oxygen,
a side member including a collector portion and contacting the electrode,
a casing, and
clamping members,
wherein the side member is urged by the clamping members toward the casing to be pressed against the electrode between the side member and the casing.